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AN EVALUATION OF THE EFFECTS OF PERSONAL RESOURCE TECHNIQUES

Thomas I. Myers and Ellen J. Eisner
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the unselected volunteers forming the similarly motivated but untreated control group. In the TM study, a number of variables were found to characterize the volunteer, the no-show, the quitter, and the continuing meditator. A reduction in significant drug involvement among meditators was observed, whereas drug usage by quitters and controls remained unchanged. Meditators also reported a variety of life changes, e.g., serenity, increased energy, and increased performance effectiveness, unmatched by either quitters and controls, and appeared to shift from relatively anxious and inhibited profiles to more spontaneity and expressiveness.

In the Karate study, fewer and weaker relationships were found. Participation in Karate was associated with somewhat improved self-esteem and mood but drug use habits were unaffected in the limited time frame of the study.

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FOREWORD

During the period 1971-1975, the Army Research Institute for the Behavioral and Social Sciences conducted a number of research efforts in the area of drug and alcohol abuse in the Army. Initial efforts were directed at developing and using techniques for accurately assessing the prevalence of illicit drug abuse and to evaluate the Army's drug education-prevention programs then in existence. Several research efforts were directed at investigating the social and environmental variables associated with drug and alcohol abuse; particular attention was paid to the role of unit level leadership.

Another research thrust in the program was to investigate possible preventive measures thought to be feasible within the military milieu. This report details one such experimental effort.

ACKNOWLEDGEMENTS

The contributions of many persons were required for the successful completion of the experiment. Essential to the research were the interest and candor of the student research subjects, who answered their voluminous questionnaires with patience and care.

Gratitude is expressed to the representatives of the Army Research Institute for the Behavioral and Social Sciences (ARI): Dr. Royer Cook, Dr. David Segal, and Dr. Douglas A. Ramsay. Drs. Cook and Segal assisted in their review of initial research plans. Dr. Ramsay served as the Contract Officer's Technical Representative, providing many astute comments and helpful suggestions.

Specialized consultants played unusually focal roles in the research. Dr. Edwin Taub helped with the experimental design and smoothly coordinated the unusual arrangements with the International Meditation Society (IMS). Mr. Arthur Findling offered research ideas and supervised the Karate training program. Ms. Marilyn Smith contributed the viewpoint of a sociologist and served as principal liaison to a college whose administrators could not have been more cooperative. Special thanks are due to Mr. George Helland and Mr. Ian Brown of IMS and to Mr. Dale Tompkins of Tompkins Karate Association, who provided excellent training in meditation and Karate, respectively, to the student volunteers selected.

The staff of the project carried out their diverse tasks with skill and persistence. Mr. Eugene Johnson III contributed notably to the selection and development of test instruments. Mr. Bob Archer, Ms. Lisa Berlin, and Ms. Gloria Kramer were diligent assistants during data collection and reduction phases. Faithful administrative and clerical support was received from Ms. Nancy Kraft and Ms. Colleen Gilbert. Special manuscript preparation and editorial services were ably provided by Ms. Ann Shore and Ms. Jane Myers.

SUMMARY

The designers of this study sought to avoid the problems of self-selection and lack of preliminary data which characterize much meditation research by employing an experimental longitudinal design. The experimenters offered to pay male college students to participate in a "Life Styles in the Seventies" survey. At the end of the first three-hour battery of tests, all 275 subjects were told about another study in which they could participate. Any student who wished could volunteer for free training in Karate and/or Transcendental Meditation. Of the more than 90 volunteers for each technique, about two-thirds were actually chosen for training. The remaining one-third served as a similarly-motivated control group. All the subjects returned four months later for a second battery of "Life Styles" questionnaires. This approach gave pre- and post-data on the non-volunteer, the volunteer who was not trained, the potential trainee who did not show, the trainee who dropped out, and the trainee who regularly meditated or who earned his yellow belt in Karate.

When compared to those students who did not volunteer, the TM volunteer was more heavily into drugs: he had started at an earlier age with alcohol and marijuana; he had experimented with a greater variety of drugs; and he had used all drugs of abuse except alcohol and hard drugs more often than the non-volunteer over the past semester. Two general personality types tended to request TM training--the unhappy, anxious introvert, and the open-minded experience-seeking non-conformist.

The volunteer who was selected for TM training but never showed up turned out to be the heavy alcohol user, suggesting that the problem drinker may have a particular reluctance to "get into himself" through meditation. The student who went through the meditation training and then quit accounted for most of the high experience-seeking, heavy drug users who volunteered. Those who became continuing meditators were the anxiously unhappy, conventional, low-experience seekers who started drugs later in their teens and had experimented somewhat less with different kinds of drugs. One-third of the meditators were classed as significant drug users at the start of the experiment. After three months of meditating, three out of seven had

sharply cut their drug use, a significant difference between the meditator and either of the two controls or the quitter. The greatest decline occurred in the use of psychedelics, "uppers," "downers," and hard drugs: two-thirds of the meditators involved with these drugs had severely restricted their use by the end of the study, a statistically significant shift.

Attributable to meditation were some other life changes reported by the subjects: they became more serene, had more energy, performed more effectively and felt better about themselves and others. In general, the meditator became freer, more spontaneous, and more impulsive than before.

Differences among various categories of Karate students were not as marked as those among the meditators. The Karate volunteer tended to be lower in self-esteem and more impulsive and emotional than the non-volunteer. Karate volunteers preferred "uppers" and used little alcohol. The non-volunteer was less sure of his physical prowess. Those who were selected for training but did not participate had a lower regard for their physical endowment. Those who completed the Karate course and continued to practice were happier, more energetic individuals with somewhat greater self-esteem, independence and arousal than the trainees who quit. Karate did not affect drug use significantly, but it did exert overall benefits such as improved self-regard and self-confidence, and it lowered some sources of fear.

Incidental to the research objective were findings about drug use among these college students. The self-reports showed that these teenagers began with alcohol, moved on to marijuana, then to one of the group that includes psychedelics, "uppers," and "downers," and then on to hard drugs. Rarely did an individual's initial experience with these drugs occur out of sequence. This is not to imply that drugs used early "cause" experimentation with the drugs used later (in which case alcohol could be blamed for everything), but probably reflects a gradient in perceived danger and social acceptability of the drugs.

TABLE OF CONTENTS

	Page
I. INTRODUCTION	1
II. RESEARCH METHOD	3
Karate and Meditation as Personal Resource Techniques	3
Technique Training	6
Evaluation Survey	6
The Separation of Training and Evaluation	7
Subject Population	8
Procedure	8
Predictor and Criterion Measures	11
Method of Data Analyses	16
III. RESULTS AND DISCUSSION OF THE KARATE EXPERIMENT	17
Prediction of Karate Participation	17
The Consequences of Karate Training	22
IV. RESULTS AND DISCUSSION OF THE MEDITATION EXPERIMENT	28
Prediction of TM Participation	32
The Consequences of Practicing TM	37
V. SUMMARY	47
REFERENCES	49
APPENDIX A - *THE BASIC DRUG USAGE QUESTIONS*	A-1
APPENDIX B - THE LIFE CHANGES INVENTORY	B-1

LIST OF TABLES

Table		Page
1	Results Profiling the Karate Volunteer, No Show, and the More Diligent (Top) Karate Student.	19
2	Comparison of the Percentages of Ss in the Karate Experiment Subgroups Significantly Involved with Drugs	23
3	Comparison of Reported Life Changes in the Karate Experiment Subgroups	25
4	Results Profiling the TM Volunteer, No Show, and the More Diligent (Top) TM Student.	33
5	Comparison of the Percentages of Ss in the Meditation Experiment Subgroups Significantly Involved with Drugs. . . .	38
6	Comparison of Reported Life Changes in the Meditation Experiment Subgroups.	42

LIST OF FIGURES

Figure		Page
1	Distribution of subjects into subgroups of the Karate experiment.	18
2	Distribution of subjects into subgroups of the Transcendental Meditation (TM) experiment	29

I. INTRODUCTION

Drug abuse ranks as one of the prime social ills of our time. Increasingly, reliance is placed upon a variety of drugs to tranquilize and soothe, to sedate, to energize, and to escape from the rigors of reality into an inner world of altered consciousness. Psychoactive substances abound, providing a wide range of possibilities for self-manipulation of arousal (e.g., amphetamines and barbiturates) and emotional states (e.g., tranquilizers and anti-depressants). The hallucinogens, most notably LSD, mescaline, and perhaps marijuana, produce an exotic refocusing of the perceptual field that many people actively pursue. Use of "social drugs" is at an all-time high, while their abuse continues to exact a tragic toll in ill health, absenteeism, and inefficiency. The immoderate or inappropriate use of drugs can have deleterious consequences, and may indicate imbalance or incompleteness in an individual, symptomatic of immaturity and maladjustment to the complex demands of modern life. While drug taking in one form or other may be the norm for various segments of the population, individuals who are preoccupied with drugs at the expense of all other endeavors represent a problem of some magnitude. Efforts to understand better and to ameliorate drug abuse can therefore be expected to contribute to the reduction of anti-social and self-destructive behavior more generally.

The present study of "Constructive Alternatives to Drug Abuse" is an attempt to discover and evaluate effective personal resource techniques which may diminish some of the unhealthy needs for excessive drug dependence and other self-defeating behavior of an individual.

II. RESEARCH METHOD

The present research stems from the notion of constructive alternatives to drug abuse as exemplified by the Federal Strategy for Drug Abuse and Drug Traffic Prevention, 1973. The central idea is that drug dependence may be prevented and/or reduced if alternative activities and methods are available to satisfy some of the psychological needs served by drugs. Much drug-taking behavior serves to elevate mood and to foster a sense of personal worth and self-understanding. Such worthy goals would be sought with an especial desperation by the types of persons linked to drug dependence (Braucht, Brakarsh, Follingstad, & Berry, 1973), i.e., individuals with relatively low self-esteem, high anxiety, depression, and a general lack of success in attaining life goals.

Karate and Meditation as Personal Resource Techniques

A critical task of the research was to identify personal resource techniques designed to reduce anxiety and to build self-esteem. The hope was to provide the individual with training in some basic life-coping skills rather than with environmental diversions, which would be, at best, extrinsic, temporary, and/or difficult to maintain. We chose to test two quite different skills--a technique for acquiring deep relaxation incompatible with feelings of stress and anxiety (Transcendental Meditation), and a mastery of one's body movement to instill greater self-confidence and assurance (Karate).

Transcendental Meditation (TM) is a simple, easily learned technique for attaining a profound state of relaxation that is mildly pleasant and physiologically restorative. Standardized instruction is obtainable from the International Meditation Society (IMS), an organization with a policy of cooperation toward evaluative scientific study. Although learning a technique of meditation can be completed within the span of a few days, the essence of meditation is to practice the deep relaxation technique regularly. Daily sessions of 15 to 20 minutes in the morning and in the evening are recommended.

A martial art taught for purposes of self-defense, Karate embodies precise control of vigorous movement with potentially devastating effects (e.g., everyone is familiar with images of the heel of a hand cleaving a brick). In contrast to TM, the mastery of Karate is a gradual process leading, after years of diligent study, to the uppermost skill status of "black belt." However, Karate training itself can lead in just a few months to appreciably increased feelings of mastery, self-confidence, and self-control. Within broad limits, everyone can succeed, and indications of progress are clear and dramatic to the student himself. Also, the training is not competitive, in that practitioners earn progressive badges of competence rather than victories over opponents. On the practical side, Karate requires no special facilities, climate, geographical conditions or wealth.

Our general plan was to attract volunteers for a battery of pencil and paper tests. At the end of the testing period, these subjects would be asked to volunteer for other studies, i.e., on karate and meditation. Some of these volunteers would receive training, then all subjects would be retested four months later. This would give base-line and longitudinal data for non-volunteers, volunteers for each of the techniques, and trainees.

From the methodological point of view, the research design consisted of a longitudinal, naturalistic experiment with research training interventions. It was planned to yield information about the types of persons initially attracted to Karate and meditation as well as the psychological effects of each type of resource training. Of crucial significance to the rigor and value of the research was the use of a multiple group design, including a non-trained control condition for each technique. Furthermore, we wanted to ensure that trained and untrained persons were alike in those motivations and attitudes which lead one to become self-selectively engaged in a pursuit such as Karate or meditation. Otherwise, any differences obtained between trained and untrained controls might be due to variations in these factors rather than to the introduction of the resource training procedure phase. To achieve such motivation-matched control groups, technique training

at no cost to the student was given to a randomly selected subset of those expressing the desire to receive the training. Training under our auspices was not given to the remainder of volunteers, who thus constituted control groups composed of persons with equivalent interests in the techniques. Due to budgetary limits, we decided not to promise free training to control group subjects on condition that they wait until completion of the study; we assumed that the dollar cost of obtaining training on one's own would probably preclude the control subjects from "defecting" from their untrained condition.

It should be emphasized that the nature and power of the inferences to be drawn from the research hinge upon these issues. The very meaning and importance of the research, rather than esoteric hairsplitting, is involved. Some of the published research on TM, for example, is without any baseline at all (except, in some cases, subjects' own recollections of their pre-TM lives) and, hence, can be viewed essentially as confirmation of the enthusiasm of enthusiasts (e.g., Benson and Wallace, 1972). Other published studies purport to use non-meditation control Ss, typically without specifying their nature and recruitment (e.g., Seeman, Nidich, and Banta, 1972). We know of no instance in the literature of usage of motivation-matched but untreated controls of the type used herein. Consequently, it can be expected that the present findings will reflect, with greater rigor and less bias than before, the essential effects of becoming involved with Karate or meditation. Any differences observed cannot be due to self-selection factors associated with voluntary interest in the technique or to changes that might have occurred anyway in like-minded persons' lives without their even becoming involved with the technique. It was our conviction that some positive indication of the value of such procedures as Karate and meditation under conditions of controlled comparison should be required before investing further effort to understand the mechanism of their effect or to apply the procedures.

We also gave considerable thought to any possible ethical questions that might be raised by our intervention in the lives of our subjects. Although participation was strictly on a voluntary basis, the research did

make access to Karate and TM easier than it would otherwise be. Since "proof" is lacking that only benefits and no harm can accrue from participation, there is some irreducible element of unknown consequence involved. We made very sure that both techniques were fully and honestly described, and no participant felt obliged through force or ignorance to stay with an activity that ceased to satisfy him. In our estimation, freedom to quit as well as to enter an activity is a substantial safeguard against enduring harm.

Technique Training

TM and Karate training were conducted by experts, closely monitored by psychologist consultants to the project who also had professional knowledge of the techniques. IMS agreed to provide meditation training on a special schedule at a location convenient for the potential student. It was also agreed that the standard cost of training would be paid by the project, a rare exception to the rule that the initiate pay his own tuition. Consultant Dr. Edward Taub facilitated such arrangements with Messrs. George Helland and Ian Brown of the Washington, D. C. Center of IMS. Mr. Helland kindly provided a special 15-minute tape-recorded introduction to TM, to be played at the convenience of the researchers to potential volunteers for TM training. For similar purposes, a recording of similar length and style was prepared by a Karate black-belt psychologist, consultant Arthur Findling, describing the nature of Karate. The four-month course of Karate instruction was provided under a subcontract arrangement by the Tompkins Karate Association, monitored by Mr. Findling. Two sections of twice-a-week, 1-1/2-hour-long sessions of instruction by black-belt qualified instructors were provided. Those Karate students avid enough to complete the four months of classes were given (and passed) the examination certifying yellow belt status. TM and Karate training were conducted quite independently, and a subject's eligibility to engage in either activity was unaffected by his status with regard to the other.

Evaluation Survey

A battery of tests, questionnaires and checklists labeled "Life Styles in the Seventies" was the vehicle for evaluating Karate and meditation technique

treatments. An initial survey and a retest survey were administered, each requiring about 3 hours to complete. Present in both surveys were criterion measures of life style (including drug use habits), mood and general outlook, reported life changes, personal traits, and adjustment. These variables will be listed in detail below. Some scales were chosen as criteria of beneficial treatment-induced changes, while other instruments were chosen as potential predictors of the interest and degree of subsequent involvement in Karate and TM. Still other measures served to round out the Life Styles survey as an enterprise in its own right.

Testing at two time points for each individual, starting with the initial survey, introduced the practical problems of longitudinal research, one being that a certain number of participants will not return for the retest. It is also impossible to maintain complete anonymity of respondents. The need to communicate later with the subjects and to collate their test scores with their status of involvement in Karate and meditation required a roster of names of persons with corresponding subject numbers. It was anticipated that persons might be unwilling to give candid responses, particularly about their usage of illegal drugs, knowing that we would be able to link name with answer. A letter from the Drug Enforcement Agency granting privileged communication status to such information was sought, partly so we could assure the students that their "secrets" could be and would be safeguarded. As it turned out, the subjects showed very little concern with this issue.

The Separation of Training and Evaluation

The training and evaluation parts of the research were separated as much as possible into activities which could stand by themselves. It was important, for the sake of dispassionate objectivity that the trainers not be involved in the appraisal. It was even more important to gain the essential evaluative information from participants with minimal perception on their part of any linkage between the two activities. Otherwise,

the recipient of training might feel obliged to respond favorably during evaluation. Insofar as possible, the impression was conveyed to the subjects that AIR was engaged in two separate projects of concern to them: (1) a survey study of life styles in the seventies entailing two long test sessions, one at the beginning and one at the end of the spring semester (to accomplish the evaluative functions); and (2) a study of popular leisure activities, like meditation and Karate, within which those volunteers chosen for free training were obligated only to provide honest feedback as to the quality of the instruction and as to their experiences (to accomplish the training function). In keeping with this separation of studies, different research personnel were utilized insofar as possible in the two activities. Ostensibly to provide completion to the leisure study, face-to-face and telephone interviews were conducted during the course of the four-month training and practice period by the leisure activities staff. However, inquiries were kept at a relatively superficial level and emphasized the student's response to the training and the extent to which he was able to attend Karate classes and/or practice the TM technique. Similarly, the culmination of the Life Styles survey with a four-month retest seemed plausible to our subjects who were at an age when development and change were occurring rapidly.

Subject Population

After choosing TM and Karate as the personal resource techniques for deep relaxation and precise bodily control, respectively, it remained to choose an appropriate subject population. Young male college students in a suburban area were selected as the research group. Students could typically be located for periodic research contacts over a period of some months, and the campus was a convenient place to conduct both training and psychological test sessions.

Procedure

Students were recruited for the survey through the media of campus newspaper ads, printed flyers, announcements made by teachers in classes, and a

recruiting booth located strategically near the cafeteria line in the Student Union. The message of the media was that students could earn extra money and perhaps learn more about themselves by participating in a Life Styles in the Seventies survey. They were told before signing up that two sessions of roughly four hours' duration each were involved, one near the beginning of the spring semester and one near the end. The student was informed that his total stipend of $22 would be unequally split ($7 in cash after the first session and $15 in cash after the second), an arrangement designed to add incentive for a return test visit. If these conditions were acceptable to him, the would-be subject filled out a registration card and received an adhesive badge containing his unique subject number and a reminder of the time and place at which to appear. By repeating the test session on a number of afternoons and evenings in a campus lecture hall, a time could be found compatible with almost any class schedule, and the sessions could be kept manageably small and informal in tone. The provision of coffee and doughnuts helped fuel the gruelingly long session.

With about 45 minutes remaining in the allotted four-hour block, the subjects were asked to cease working on the test booklets and give their attention to a second researcher from AIR, who was there to describe a second AIR research activity concerned with popular leisure activities. The gist of the new project was to study two new activities of growing popularity, Transcendental Meditation and Karate, through the reactions of students to be recruited by chance from the pool of those survey participants expressing interest. It was to be understood that in return for the tuition costs supplied by AIR, the student was obligated only to talk with the researchers from time to time concerning his reactions particularly to the quality and pacing of instruction and the like. Two special 15-minute recordings about Karate and TM were then played to the assembled group. The subjects were told that they could volunteer for neither, either, or both activities, and that their chances of selection for one would be unaffected by the drawing for the other class. Preprinted 5x8 cards were then filled out by each subject indicating volunteering decisions, name, address and telephone number, and a brief description of any prior experience with

Karate and TM. After collecting cards and booklets, survey participants received the first installment ($7) of the survey stipend and were instructed that they would be contacted later in the semester as to the follow-up survey schedule. A total of 275 students participated to this extent.

Letters were sent out in mid-May detailing a set of alternate retest times, both before and after final exams. Students who appeared at one of these sessions received a test battery of about three hours' duration followed by the $15 stipend. A total of 182 of the 275 original subjects reappeared for the late semester retest.

About half of the original 275 men were involved in no more than the survey(s), since they had volunteered *neither for Karate nor for TM training*. The remaining individuals stood about a two-out-of-three chance of being selected for the training course(s) for which they had volunteered. Those selected for Karate were given the schedule for the two twice-a-week sections of 15-week instruction which had been arranged, and were encouraged to attend. Progress of the students was monitored periodically by Mr. Findling, and attendance records for each class obtained. After the course of instruction was over, Mr. Findling also interviewed by telephone nearly all of the Karate students. The interview contained open-ended questions and semi-structured items, mostly about the student's reaction to the training and his progress.

Roughly two-thirds of the TM volunteers were also contacted with the news that they had been selected to receive TM instruction. The latter entailed specified activities on each of six successive days--two lectures, personal instruction, and three group sessions, in that order. For the convenience of potential initiates, many of these sessions were scheduled on the campus. Mainly to ensure that volunteers would have several months during which to practice meditation before the evaluative survey retest, time limits were set within which selectees had to appear at the prescribed times and places. If a subject did not avail himself of the opportunity for specially arranged TM training within about a month, his chance was lost. The TM instruction also included once-a-week checking with the initiator during

the first month and once-a-month checking thereafter. A detailed telephone interview with each TM participant was made by Ms. Eisner in May-July. The indispensable goal of this inquiry was to establish the frequency with which the subject had been practicing TM in the months between his initiation and the interview. In addition, reactions to the instruction were sampled and reasons ascertained as to why the meditator may have ceased to meditate.

Predictor and Criterion Measures

This report presents findings for a total of 68 psychosocial and behavioral measures, most of which were selected as predictor candidates. Many of these measures can also serve reasonably, and a few exclusively, as criterion yardsticks. The variables fall into five broad categories: Drug Usage (13 indices); Biographical Variables (10 variables); General Outlook (3 scales) and Mood (16 scores); Personality and Adjustment (17 scales); and Reported Life Changes (9 factors). Each will be described briefly, in turn. (See also Tables 1 and 4.)

1. Drug Usage.--Because of the idea that Karate and meditation may serve as constructive alternatives to drug abuse, and, hence, result in a reduction of significant drug involvement, it behooved us to survey drug use frequency and patterns in some detail, and to pay particular attention to properties of the measures. The questionnaire items defining the six generic categories of drugs--alcohol (ALC), marijuana (MJ), psychedelic (PD), "uppers" (UP), "downers" (DN), and hard drugs (HD)--and the format for reporting frequency of use for these six categories during the last completed semester are reproduced in Appendix A. In addition to surveying typical frequency of use, subjects were asked to indicate which types of drugs they had EVER used to the extent of experiencing an effect and their age at the time of such first use. Since the vast majority of our male college student subjects had experienced ALC and MJ effects, the first two drug-use measures were the reported age of first use for alcohol and age of first use of marijuana.

Pattern analysis of EVER drug use revealed some regularities which enabled us to devise a four-category Drug Experience Scale. On this scale, 0 represents no drug experience; 1 stands for ALC use only; 2 was assigned to ALC and MJ users; 3 means that the subject has used ALC, MJ

and any one of the categories PD, UP and DN; and 4 includes use of the previously mentioned drugs and HD. This Guttman cumulative scale pattern was found to have a .997 Coefficient of Reproducibility, indicating that this simple Drug Experience Scale is a highly accurate index of drug experimentation patterns. A more complete amplification of the patterns and sequence of drug use in our population can be found in Appendix A.

Frequency of drug use last semester in the six categories constituted a less unified pattern. Inspection of the intercorrelations showed low interrelation among frequency of usage in the six categories, e.g., r = .23 between ALC and MJ. Consequently, the six variables for last semester usage are carried through the analyses. Most subjects reported relatively low frequencies of usage, and only a minority of subjects appeared to be preoccupied or heavily involved with drugs. To categorize individuals as showing "significant usage" levels or not for ALC, MJ, and all OTHER drugs seemed to be a useful procedure for focusing upon really important degrees of dependence. Any threshold one might adopt would be arbitrary. For the present purposes, use of ALC or MJ at the rate of three or four times a week or higher was taken as a mark of "significant involvement." In the case of the more rarely used drugs (PD, UP, DN, and HD), any use of two or more of these drugs last semester was regarded as significant, as was use of any single drug more than once a month. These three "significant usage" variables, plus a composite "Any of above," were used as predictor and criterion change indicators.

2. Biographical Variables.--A limited set of biographical variables were employed in the present analyses--most of these were thought to be proximal to interest and potential involvement in Karate and meditation. School Load and Work Load looked to be possible moderators of whether the subject might truly have time to engage in such additional unplanned activities during the semester as Karate and TM. Life Experience scores, shown to be predictive of future distress and psychosomatic ailments, might be a predictor of interest particularly in TM, since TM purportedly diminishes the buffeting one receives from the ordinary stresses and strains of life.

"Familiarity with TM" is a single rating of knowledge and sympathy for a number of activities--in this instance, the TM movement. If the subjects responded with any veracity to the tests, responses to this item should be related to willingness to become involved in TM, as ascertained the same evening on the volunteer cards.

A final group of six self-ratings of Physical Proficiency were included for their potential relevance to Karate involvement. Even though it is claimed that one need not be exceptionally endowed with athletic skills to succeed in Karate, we retained the suspicion that perhaps those persons with especial ability (and likely past reinforcements for athletic efforts) might be particularly motivated to work persistently at Karate. The ratings we devised were of General Athletic Ability, Coordination, Speed, Endurance, Steadiness and Precision of Movement, and Strength. Each six-space graphic rating item contained the anchors "low," "average," and "high."

3. General Outlook and Mood.--A Life Satisfaction scale from the Survey Research Institute, the Anomy scale of McClosky and Schaar, and the Self-Esteem scale of Rosenberg were selected as general reflections of the positiveness of one's outlook toward life, toward society, and toward self. Although potentially predictive of a desire to try new opportunities such as Karate and TM to improve one's life, such outlook indices could also serve as general barometers of any positive change.

Rather more specific feeling states are surveyed in the various measures of affect and mood which were utilized. Zuckerman's Multiple Affect Adjective Check List embraces factors of Anxiety, Depression, and Hostility, each keyed to endorsement of certain "negative" affect items and the non-endorsement of specified positive items. Depending on instructional set, the MAACL can tap the gamut from state (typically, "How do you feel now?") to trait (typically, "How do you feel normally?"). We departed somewhat from these temporal sets in the two forms that we used. The one labeled "trait," inquired as to feeling states during the "past three months," a value chosen to reflect virtually the entire period subtended by the experimental treatments. The second, a "state" form, designated the "past several days" as

the interval to be evaluated. We deliberately chose this broader interval, rather than "now" or "today," hoping to smooth out some of the impact of impending examinations and the like, which have been shown experimentally to elevate negative mood scores.

A second mood reporting instrument was our own Primary Affect Scale (Johnson & Myers, 1967). Best descriptors chosen from pre-scaled brief word lists permit assignment of scores in five categories: Happiness, Anger, Fear, Depression and Arousal. It differs from the MAACL at least in the separation of a Happiness factor from the negative affect domains, and in the additional provision of an Arousal scale.

4. Personality and Adjustment.--A complex calculus of considerations guided the choice of personality "traits" to be assessed as principal, potential predictors of Karate and meditation interest and involvement. Acts of volunteering, per se, have been rather consistently predicted by Zuckerman's Sensation Seeking Scale (SSS), which also contains specific subscales with a growing history of differential correlational relevance (e.g., to drug preferences). Scales that might be descriptive of the "drug user personality" would be desirable if Karate and TM have appeal and potential ameliorative influence upon such persons. The Taylor Manifest Anxiety Scale, (TMAS) has been widely used as an index of distress, and is now scoreable into subtests highlighting cognitive Worry as well as bodily symptoms of Emotionality. Emotional Stability, as measured by the Thurstone Temperament Scale, was used to reflect a non-anxious indication. Eysenck's Extraversion, a widely used measure of Introversion-Extraversion, is now scoreable into Sociability and Impulsiveness components. Eysenck claims that Extraversion and Neuroticism define a two-dimension plane which accounts for important behavioral and temperamental phenomena. The Lie scale from the EPS furnished us with one index of test-taking validity. The Fitzgerald Experience Inquiry, subtitled Openness to Experience, was selected because of its outstandingly strong relevance to tolerance of reduced sensory input. We hypothesized that the same types of persons might take to meditation more readily. The CPI scales used--Socialization, Flexibility, Achievement by Independence, and Achievement by Conformance--have been found repeatedly and consistently

related to marijuana use in college student populations.

5. Reported Life Change Inventory.--The more we became acquainted with meditation and meditators, the less convinced we were that the conventional personality and mood measures chosen for inclusion would do justice in reflecting the kinds of changes attributed to meditation. Consequently, with a helpful input from Dr. Lee Otis of Stanford Research Institute, we proceeded to develop a more germane Reported Life Change Inventory. An extensive content analysis of the claimed benefits of TM served as the point of departure. Decisions were made as to how these many alleged dividends might be grouped, and a series of item concepts were elaborated to represent these seeming gains within seven a priori content areas: Serene Emotionality, Flexible Mode of Functioning, Increased Energy, Performance Effectiveness, Perception of Self, Perception of Others, and Physical Health. Two more groups of items were included, one intended to appraise the kind of Self-Sufficiency ostensibly improved by Karate training. A final set of Homely Virtues simply listed many areas of concern to our student subjects, particularly in relation to the values of their parents.

The items and response format for this new test are reproduced as Appendix B. Although an eight-category format was utilized, data analyses proceeded from a dichotomous score matrix formed by splitting each item at the median point. In most instances, a "considerable" or greater change in the positive direction was required for a respondent to receive a score of "1" on an item. Factor scores in the nine areas were derived by summing dichotomous scores according to a priori keys.

The median Kuder-Richardson reliability coefficient obtained for the nine factors was .79, with the lowest homogeneity of content observed, curiously enough, for the estimates of physical health (.49). The items keyed within factors and the factor reliabilities are presented in Tables 3 and 6 for the Karate and TM experiments, respectively. Since the Life Change Inventory was given with the survey retest only and reflected changes that had occurred only within the preceding three months, we have used Life Change scores as criteria of the resource training experiments and not as predictors.

Method of Data Analyses

Straightforward 't' test analyses were carried out to compare mean predictor scores of various experimental subgroupings (e.g., the Karate [and TM] volunteer vs. the nonvolunteer; the student vs. the "no show"; and the variously defined "avid" vs. "lukewarm" meditators and Karate students). Paired measure 't' tests were employed to evaluate pre- to post-treatment changes on the several criteria, while independent group 't' was again used to contrast the transgenerated change scores of various pairs of experimental subgroups, e.g., "avid" vs. "lukewarm" meditators (or Karate students), or meditation controls vs. meditators, and top Karate students vs. Karate controls. Although more sophisticated and multivariate analyses might profitably be used, we envisioned the present procedures as simple first cuts, analytically, at the following questions:

"Who tends to volunteer for TM?"

"Is there a particular type of TM volunteer who is likely to become deeply involved in practicing meditation?"

"Do avid meditators experience beneficial psychological changes and reduced drug dependence more than quitters?"

"Do practicing meditators show greater benefits and less drug abuse than untreated control subjects who have been similarly attracted to the possibility of TM?"

A parallel set of questions was addressed for the Karate training.

A number of product moment correlation coefficients was also computed to parallel the 't' test calculations (even if one or both variables were dichotomous). The values of r provided at least a rough indication of the extent of covariance or predictability inherent in a given relationship. Coded significance levels alone can be somewhat deceptive since they are so markedly a function of N. The r's are used as a background for discussion, however, and are not shown in the tables in the Results sections (III and IV).

III. RESULTS AND DISCUSSION OF THE KARATE EXPERIMENT

The classification of subjects into the subgroups of the Karate experiment--as a product both of the experimental intervention and student responses--is schematized in Figure 1. Of the 275 survey participants who were told of the possibility of their being given Karate training as part of the leisure study, there were 92 volunteers (a rate of 33%). Of those subjects entering the lottery of selection to receive training, we chose 62 names for inclusion, leaving the 30 unselected persons to form the Karate control group. Of the 62 thus eligible for training, thirty-nine showed up for at least one Karate session (the Students) while 23 failed to appear at all (the No Shows).

Not all of the 39 beginners continued to attend the twice-weekly classes faithfully. Quite a few attended for a few sessions or weeks before ceasing to return. Smaller numbers of students fell by the wayside after a more substantial beginning. In general, the patterns were clear-cut. Once a student missed two consecutive classes, it was statistically unlikely that he would ever return. A simple count of the number of classes attended thus reflected the duration of his involvement with Karate as well as the extent of his training and practice.

Since those who do not "really" engage in Karate study cannot fairly be regarded as tests of the art, in terms of its psychological consequences, some reasonable basis was sought for identifying the regular, top Karate student. Arbitrarily, the dividing line was drawn according to whether the student had attended more than one-half of the sessions (Top K) or not (Dropouts). By this standard, there were 13 Top K and 26 Dropout students.

Prediction of Karate Participation

The first set of analyses to be summarized (Table 1) examined the predictor variables in order to provide a profile of the Karate volunteer, the No Show, and the Top K student. Relatively few of the variables differentiated the groupings.

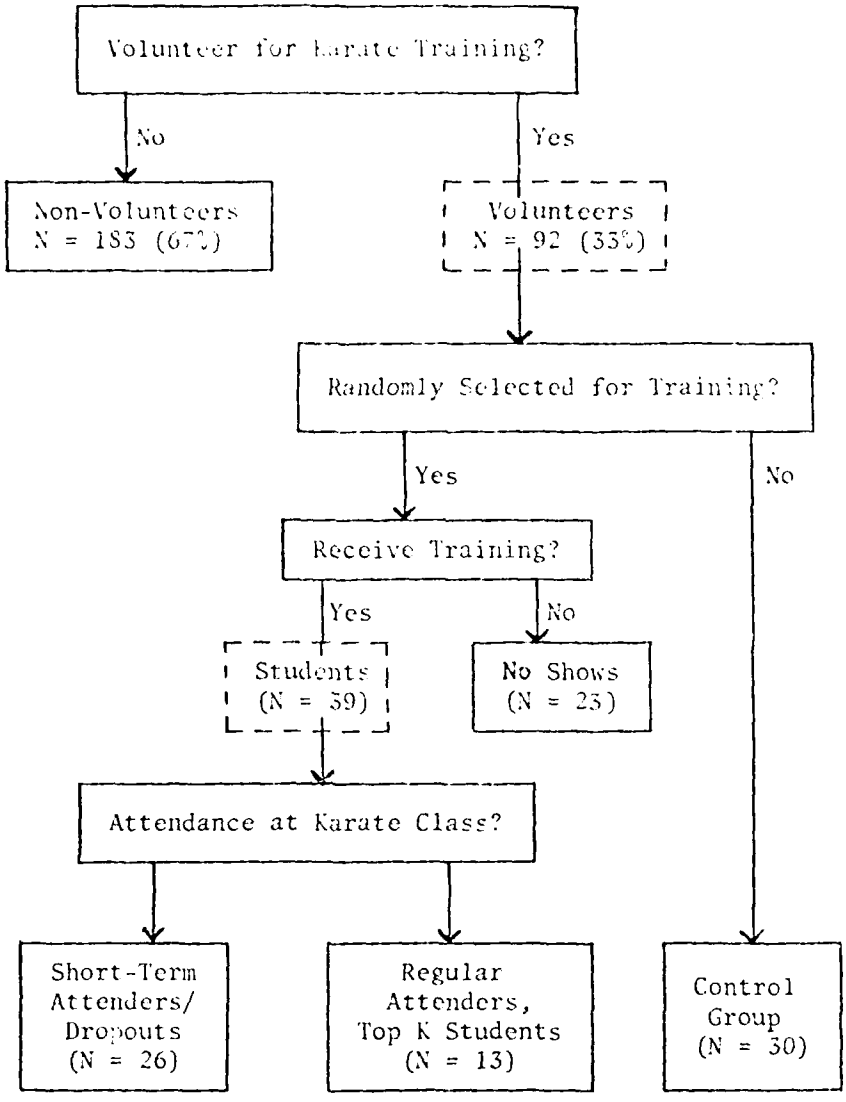

Fig. 1. Distribution of subjects into subgroups of the Karate experiment.

TABLE 1

Results Profiling the Karate Volunteer, No Show, and the More Diligent (Top) Karate Student

Predictor Variable	Karate Experiment Comparison		
	K Volunteers vs. Non-Volunteers	K Students vs. No Shows (NoS)	Top K Students vs. Dropouts
1. DRUG USAGE			
Age of First Use, ALC	-----	-----	-----
Age of First Use, MJ	-----	-----	-----
Drug Experience Scale	-----	-----	-----
Frequency of Usage, Last Sem. (Baseline):			
ALC	Lower for Vol. (*)	-----	-----
MJ	-----	-----	-----
PD	-----	-----	-----
UP	Higher for Vol. (*)	-----	-----
DN	-----	-----	-----
HD	-----	-----	Higher for Top K (x)
"Significant" Usage, Last Sem. (Baseline):			
ALC	-----	-----	-----
MJ	-----	-----	Lower for Top K (x)
Other	-----	-----	-----
Any of above	-----	-----	-----
2. BIOGRAPHICAL VARIABLES			
School Load	-----	-----	-----
Work Load	-----	-----	-----
Life Experiences	-----	-----	-----
Familiarity with TM	-----	-----	-----
Physical Proficiency, Self-Ratings:			
General Athletic Ability	-----	-----	-----
Coordination	-----	Lower for NoS (x)	Lower for Top K (x)

TABLE 1 (Cont'd)

Predictor Variable	Karate Experiment Comparison		
	K Volunteers vs. Non-Volunteers	K Students vs. No Shows (NoS)	Top K Students vs. Dropouts
Physical Proficiency, Self-Ratings (cont'd):			
Speed	-----	-----	-----
Endurance	Higher for Vol. (x)	Lower for NoS (x)	-----
Steadiness and Precision of Movement	Higher for Vol. (*)	Lower for NoS (*)	Lower for Top K (x)
Strength	Higher for Vol. (*)	Lower for NoS (x)	-----
3. GENERAL OUTLOOK/MOOD SCALES			
Life Satisfaction	-----	-----	-----
Anomy	-----	-----	Lower for Top K (x)
Self-Esteem	Lower for Vol. (x)	-----	Higher for Top K (*)
State, MAACL, Past several days:			
Anxiety	-----	-----	-----
Depression	-----	-----	-----
Hostility	-----	-----	-----
Trait, MAACL, Past three months:			
Anxiety	-----	-----	-----
Depression	-----	-----	-----
Hostility	-----	-----	-----
State, PAS, Past several days:			
Happiness	-----	-----	-----
Anger	-----	-----	-----
Fear	-----	-----	-----
Depression	-----	-----	-----
Arousal	-----	-----	Higher for Top K (*)
Trait, PAS, Past three months:			
Happiness	-----	-----	-----
Anger	-----	-----	-----
Fear	-----	-----	-----
Depression	-----	-----	-----
Arousal	-----	-----	-----

TABLE 1 (Cont'd)

Predictor Variable	Karate Experiment Comparison		
	K Volunteers vs. Non-Volunteers	K Students vs. No Shows (NoS)	Top K Students vs. Dropouts
4. PERSONALITY TRAITS			
Emotional Stability, TTS	-----	-----	-----
Taylor Manifest Anxiety Scale (TMAS)	-----	-----	Lower for Top K (*)
Worry	-----	-----	-----
Emotionality	Higher for Vol. (*)	-----	Lower for Top K (*)
Extraversion, EPS	-----	-----	-----
Impulsivity	Higher for Vol. (*)	-----	-----
Sociability	-----	-----	-----
Lie Scale, EPS	-----	-----	-----
Socialization, CPI	-----	-----	-----
Flexibility, CPI	-----	-----	-----
Achievement by Independence, CPI	-----	-----	Higher for Top K (*)
Achievement by Conformance, CPI	-----	-----	-----
Fitzgerald Experience Inquiry (EI)	-----	-----	-----
Sensation Seeking Scale (SSS):			
General Scale (GS)	-----	-----	-----
Thrill and Adventure (TA)	-----	-----	-----
Experience Seeking (ES)	-----	-----	-----
Disinhibition (Dis)	-----	-----	-----
Boredom Susceptibility (BS)	-----	-----	-----

Note.--*, $P < .05$; x, $P < .10$, two tailed, except for Physical Proficiency ratings.

The Volunteer was somewhat lower in Self-Esteem, and somewhat more Impulsive and Emotional. In the drug realm, he appeared to disfavor alcohol and favor "uppers." Most interestingly, Karate Volunteers rated themselves somewhat higher on Strength, Endurance, and Steadiness and Precision of Movement. To some extent, it appears that persons lacking a positive self-image of physical prowess shy away from the Karate experience.

Even fewer variables profiled the No Shows. But those Volunteers with relatively lower self-estimates of Coordination, Endurance, Strength, and Steadiness and Precision of Movement tended to become No Shows. To volunteer initially, and to actually attend the free training offered, thus "required" a rather successively higher positive image of one's physical endowment. Baseline measures distinguishing the Top K student from the Dropout were more numerous. There were indications that the Top K is a happier, more energetic individual. He scored higher on Self-Esteem, Independence, and subjective Arousal; and lower on Anomy, TMAS, and Emotionality.

Though these descriptions seem reasonable enough, we would conclude, on balance, that not much light has been shed on the character of the potentially enthusiastic Karate student. Certainly, the covariance underlying the associations shown is not great, so we have accounted for relatively little variance with the variables included in our profile descriptions. We may have simply failed to choose the "right" ones in the first place. Or, perhaps extrinsic social factors may play a disproportionately large role in shaping Karate-relevant behavior--e.g., martial arts appear prominently in the media.

The Consequences of Karate Training

Changes in Significant Drug Involvement scores for Top K, Dropouts, and Karate Controls are shown in Table 2. Albeit with small Ns and other disclaimers, there is little to differentiate the groups. For some reason, the Top K students were deviantly low in baseline semester MJ use, the "recovery" from which looms as a significantly larger usage increase. There is no evidence that beginning Karate participation modifies significant drug involvement.

TABLE 2

Comparison of the Percentages of Ss in the Karate Experiment Subgroups Significantly Involved[1] with Drugs

Drug Category		Controls N = 22		Top Karate Students N = 11		Karate Dropouts N = 16
ALC	Pre	27		27		19
	Post	27		27		38
	Change	0		0		+19
MJ	Pre	56	*	18	x	50
	Post	41		45		50
	Change	-14	**	+27	x	0
Other (PD, UP, DN, HD)	Pre	23		27		31
	Post	32		18		31
	Change	+09		-09		0
One or more of above categories	Pre	68		55		82
	Post	59		64		69
	Change	-09		+09		-13

Note.--'t' test comparisons carried out between groups and across time periods; **, $P < .01$; *, $P < .05$; and x, $P < .10$, all two tailed.

[1]"Significant involvement" with alcohol and with marijuana was defined as usage "3 or 4 times a week" or more; "significant involvement" with other substances was defined as any reported use of two or more substances or more than once a month usage of any one substance.

The same Karate treatment groups are compared with respect to Reported Life Changes in Table 3. The most interpretable outcome pattern, with respect to the Karate experience, is for scores in the Top K group (middle column) to exceed both those in the right-hand column (the Dropouts) and the left-hand column (the Controls). This pattern, with at least trend-level statistical significance, is apparent for Increased Energy, Performance Effectiveness, Self-Sufficiency, and Perception of Self. In particular, it had been hypothesized that engaging in Karate would build Self-Sufficiency, a notion receiving only one-tailed .20 level support. Among the curiosities in the table is the somewhat lower Physical Health reports of Karate students, which may reflect the sharp aches and pains attendant to the art!

Change score comparisons for Outlook/Mood and Personality and Adjustment variables were also made. There were no conspicuous shifts in personality trait factors that were differential to treatment grouping. Since traits are psychometrically required to be those more stable facets of the individual, it perhaps should come as no surprise that trait changes due to Karate were minimal.

A pattern of statistically weak results suggested that Karate may improve Self-Esteem (.108 level) and decrease State Depression (.105) and Hostility (.060). Top K students also showed greater increases in subjective liveliness or Arousal, and decreased Fear, Depression, and Happiness.

It is our best judgment that Karate does exert an overall beneficial influence upon its proponents, such as to improve self-regard, self-confidence, and to reduce some sources of fear. While the measured, statistical evidence of these effects in the present study are not resounding, our informal, subjective impressions while conducting the study do support this view. Certainly the small Ns used would require that detected effects be rather large and consistent across individuals, and it may be that a one-semester exposure is simply not enough to induce strong manifestation of the hypothesized true benefits. We did debate at some length as to whether the study was feasible when time schedules compressed the maximum duration of training as they did; expert opinion was divided on the question.

TABLE 3

Comparison of Reported Life Changes in the Karate Experiment Subgroups

Reported Life Change Factor	Control Subjects N = 16		Top Karate Students N = 11		Karate Dropouts N = 12
A. Serene Emotionality (Reduced frustration, anxiety, depression; emotional stability, well-being, serenity, inner peace, evenness of disposition) [8 items, K-R_{20} = .79]	2.44	*	3.91		4.25
B. More Flexible Mode of Functioning (Creativity, imagination, intuition, flexibility, spontaneity, openness, sense of humor; integration) [9 items, K-R_{20} = .67]	3.94		4.45		4.17
C. Increased Energy (More able to relax, stamina, energy level, evenness of energy, more restful sleep, reduced fatigue) [6 items, K-R_{20} = .82]	3.13		3.45	x	2.33
D. Performance Effectiveness (Efficiency, alertness, quickness, endurance, effectiveness, control of attention, concentration, less distractibility) [8 items, K-R_{20} = .78]	3.19	·	4.28	*	2.83
E. Perception of Self (Breadth of awareness, ability to listen, clearness of surroundings, self-understanding, liking of self, reduced confusion, boredom, restlessness) [8 items, K-R_{20} = .74]	3.19		3.45	·	2.42
F. Perception of Others (Tolerance of others; perception of others' needs and roles; liking for others; friendliness, adaptability, understanding of others, sexual adjustment, expressiveness, suggestibility) [9 items, K-R_{20} = .77]	4.81		4.36		4.92

TABLE 3 (Cont'd)

Reported Life Change Factor	Control Subjects N = 16		Top Karate Students N = 11	Karate Dropouts N = 12
G. Self-Sufficiency (Self-sufficient, self-confidence, powerfulness, efficiency, alertness, quickness, flexibility, adaptability, self-control) [9 items, K-R_{20} = .81]	4.00	·	4.91	4.33
H. Homely Virtues (Ambition, competitiveness, curiosity, diligence, desire for accomplishment, maturity, punctuality, responsibility, self-control, thoroughness) [10 items, K-R_{20} = .61]	4.31		4.45	5.00
I. Physical Health (Improved overall health, reduced colds/flu, headaches, muscular aches, stomach upsets) [5 items, K-R_{20} = .49]	2.63	·	2.09	2.17

Note.--*, $P < .05$; x, $P < .10$; and ·, $P < .20$, single tailed.

Another possible explanation is that class attendance, taken exclusively, may not be a very good way to define the pivotal Karate groups. Although faithful attenders can probably be safely included among the "Karate-involved," it is conceivable that the "Dropouts" of the study included both "involved" and "uninvolved" persons. An instance comes to mind of an enthusiastic Karate student who had to quit coming to class midway in the course due to a lingering injury sustained in gym class. The post-semester interviews with the Karate students also revealed a rather common tendency for those defined above as "Dropouts" to speak quite positively about Karate, to overestimate the number of sessions they had attended, and to regard themselves as still involved in Karate. In some sense, many of these persons may have been visited by the psychological benefits following from precise physical self-control, at least in a germinal form destined to take root. These comments, of course, speak to some of the inherent complexities of most fruitfully defining Karate involvement, and do not in themselves bear as fully upon the likelihood of statistically significant contrasts with the Controls.

There were indications that beginning Karate improved one's self-esteem, mood states, and self-sufficiency. The data provided no support for the idea that novice Karate study might affect drug-taking habits. One might venture the guess that drug excesses would decrease eventually as one progresses into Karate. As the mechanism behind such a change, one might envision a gradual improvement of ego function and relationships with the world such that drugs could eventually be discarded.

IV. RESULTS AND DISCUSSION OF THE MEDITATION EXPERIMENT

The distribution of research subjects into the subgroups of the Transcendental Meditation (TM) experiment is diagrammed in Figure 2. Of the initial Life Styles Survey participants asked whether they might like to receive TM training as part of an AIR leisure pursuit study, 34% did volunteer for TM. Thus, about the same proportion of one in three signed up for TM as signed up for Karate. The two acts of volunteering were somewhat correlated (r_{tet} = .36). About equal numbers of subjects chose Karate only, TM only, and both Karate and TM. About half of the total subject pool volunteered for neither. The TM nonvolunteer, of course, heard nothing further about the TM study, although he was later asked to return for the retest which completed the Life Styles Survey. Three students who indicated that they had already taken TM were excluded from consideration, as were two other nonvolunteers of ambiguous meditation experience.

Sixty-four of the TM volunteers were randomly selected to receive the TM training. Those 27 volunteers not selected constituted the TM Control Group. A 28th member of the Control Group went into TM at his own initiative and expense during the experimental period, and thus had to be excluded from the study.

Thirty-one volunteers began TM, and the followup information was obtained from 27. Since not all volunteers could be expected to practice meditation regularly, and hence experience the alleged benefits, a crucial research need was a sensible and fair procedure to define the category "Meditator." Reported frequency of meditating was the most obvious basis for such a definition. According to meditators, the gains are a direct function of practice. Consequently, in the follow-up telephone interview, we obtained reports of meditational frequency during various time periods--at present, during the first month, and after the first month. To stabilize scores against such sources of fluctuation as final exam week, we decided to average the "at present" and "since the first month" estimates. The resulting frequency reports spanned the entire range from zero to the twice daily frequency recommended by IMS, with most individuals in the lower half

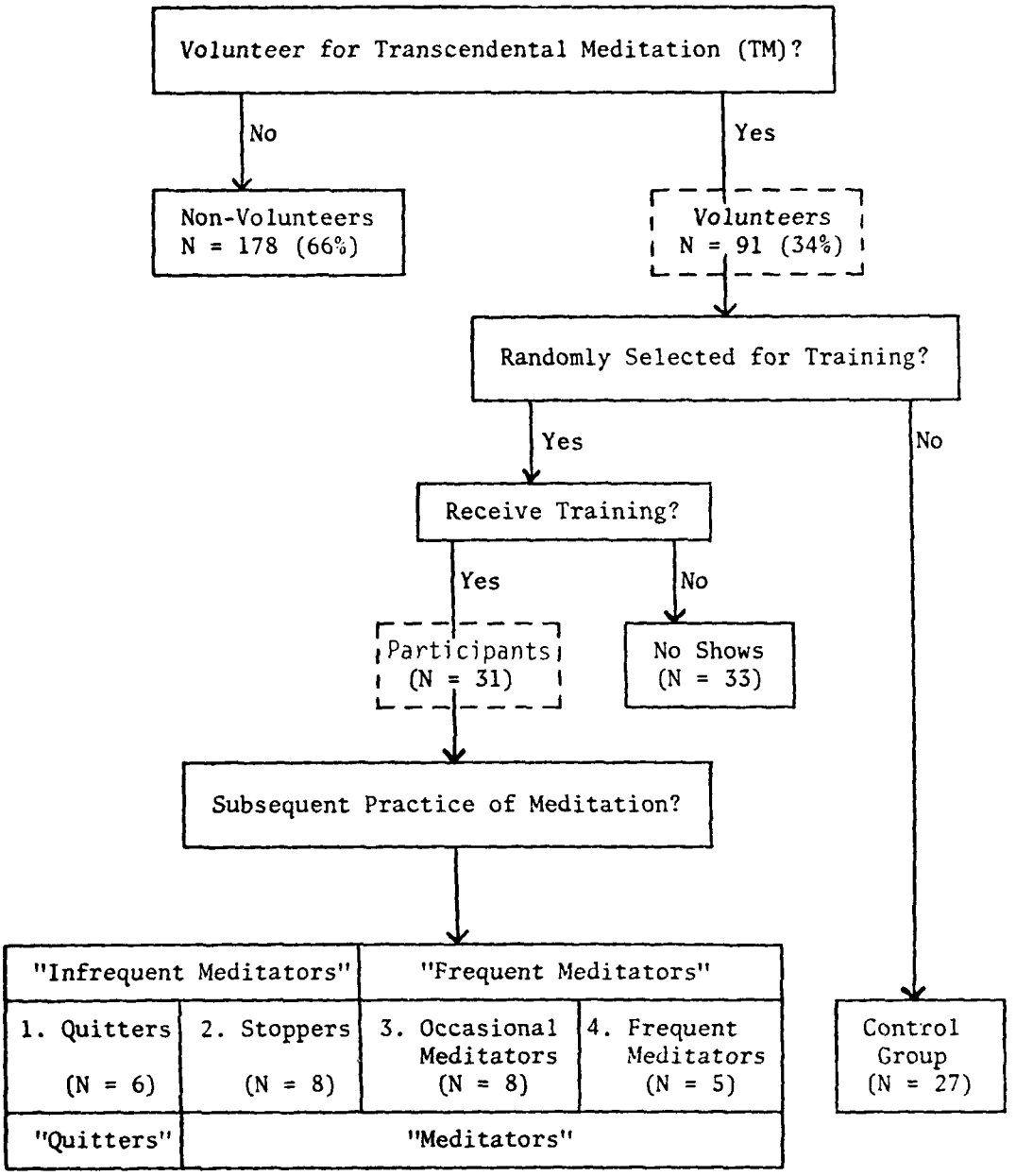

Fig. 2. Distribution of subjects into subgroups of the Transcendental Meditation (TM) experiment.

of the range. Fourteen infrequent meditators averaged less than 3.5 times a week, eight occasional meditators scored from 3.5 to 7 times weekly, and five frequent meditators reported 7 to 14 meditations per week. In terms of the diagram in Figure 2, these frequency of meditation subgroupings correspond to groups 1 and 2 combined, group 3, and group 4, respectively. For purposes of simplifying most statistical portrayals of the meditators grouped in terms of frequency, groups 3 and 4 were pooled. Thus, as shown above the fourfold groups in Figure 2, the 13 "Frequent Meditators" could be compared with the 14 "Infrequent Meditators." Although meditating four or five times per week may seem too infrequent to warrant inclusion among the "Frequent Meditators" category, the weak alternative would have been to decrease an already small N of 13. The effect of the rather low rates of meditation used to represent "Meditators" is to generate conservative underestimates of the effect of meditation.

We did not feel wholly content with a single definition of the meditator in terms of frequency. The interviews were a rich source of information suggesting, among other things, that each case is really quite unique. They suggested a concept of "involvement" with TM based partly, but not exclusively, upon meditational frequency. This was particularly apparent among the 14 "Infrequent Meditators," 12 of whom had ceased meditating during one or more of the time periods averaged. Wide differences were found in the kinds of reasons that the subject gave for ceasing to meditate within a time period. Some emphasized limitations of time and schedule (such as at final exam week, and the like) as instrumental in their ceasing to meditate. Others tended to cite reasons of disinterest, such as that TM just "wasn't their thing," in discussing termination. These reasons-for-ceasing comments were used to further classify the 14 infrequent meditators into "Quitters" and "Stoppers." Those six respondents mentioning reasons of disinterest as instrumental were defined as Quitters (category 1 in Figure 2). Those 8 who had tended to blame time and schedule problems for their ceasing were termed Stoppers (category 2 in Figure 2). Although the distinction is a subtle one, we had the impression that the Quitters would not be likely to meditate very often in the future, whereas the Stoppers may very well return

to the practice at former or even higher rates. To this extent, the classification may relate to ultimate frequency of meditation over a longer time frame than was encompassed by the study. We therefore elected to locate Quitters below Stoppers on a compound dimension--meditational involvement--represented by the one-two-three-four progression of groupings in Figure 2. (The two infrequent meditators who had not ceased in either time period of the average were placed with the Stoppers, resulting in the indicated N of 8 in Group 2.) Again, in order to designate "meditators" categorically, a dichotomy was formed consisting of the 21 "Meditators" and the six "Quitters." The rationale for this distinction based on more than frequency is that one would be considered to be a meditator until he stopped and was willing to say that it was "not for him." Parallel calculations were performed on the data for both ways of defining "the meditator."

Of the 64 selectees eligible for TM training, more than half (33) failed to show up for initiation into TM under our auspices. The large number of No Shows may have been due to a number of factors beyond any loss of interest. The six-day configuration of sessions involved in TM training may have been difficult for individuals to attend, particularly on the short notice and within the limited time span allowed. In order that TMers might have at least a three-month period in which to practice their meditation before completing the evaluation survey, only three to four weeks could be allowed for the training. The IMS trainers went to considerable lengths to make the training sequences convenient and accessible, but the response was less than anticipated.

It should be noted that IMS policy stipulates that a person be off nonprescription drugs (other than alcohol) for 15 days prior to beginning participation. It is held that the benefits of meditation cannot be realized when even drug residues are present. This condition had been spelled out in the original message heard by subjects before they volunteered, and reiterated at lectures preceding participation. Thus, these ground rules were known to the drug user even before he volunteered, but it is still possible that heavy drug users tended to be No Shows in deference to their habits. In talking with the selectees, most said they would attend a

particular sequence of sessions and then failed to do so; very few mentioned any loss of interest in TM. The analysis of predictor variables descriptive of the No Show was anticipated with great interest, since the No Show phenomenon reflects upon the generality of appeal by a procedure such as TM.

Prediction of TM Participation

Summarized in Table 4 are the results of predictor variable analyses descriptive of the TM Volunteer, the No Show, the Quitter, and the Frequent Meditator (proceeding, respectively, from the leftmost to the rightmost column of the table).

The TM Volunteer turned out to be notable in many respects. He was more heavily into drugs than the non-volunteer. He had used alcohol and pot at an earlier age, scored higher on the Drug Experience Scale, and reported a greater baseline, last-semester usage of MJ, PD, UP, and DN. A relatively greater previous familiarity with TM, not surprisingly, was significantly related to volunteering. Volunteers, on the average, scored higher on Manifest Anxiety, Worry, Emotionality, and Introversion, and had lower Life Satisfaction and Self-Esteem scores. State Happiness and Arousal were lower. The Volunteers, on the average, also received higher scores in the area of Sensation Seeking (especially Experience Seeking and Boredom Susceptibility aspects) and tended to be more Open to Experience (EI). Not every TM Volunteer, of course, possessed this raft of discriminating traits. Anxious introversion does not usually coexist with high sensation seeking, so clearly at least two types of persons tend to volunteer for TM--the unhappy, anxious introvert, and the open-minded, experience-seeking non-conformist. The heavy drug use cluster might co-vary with either or both of these typologies. High significance levels were obtained with these large N comparisons, and analogous correlations ranged into the thirties. Assuming several independent constellations presumably contained within the Volunteer, an estimable part of the variance may have been accounted for.

TABLE 4

Results Profiling the TM Volunteer, No Show, and the More Diligent (Top) TM Student

Predictor Variable	Meditation Experiment Comparison			
	TM Vol. vs. Non-Vol.	No Shows (NoS) vs. TM Participants	Quitters (Q) vs. Meditators	Frequent Meditators vs. Infreq. Meditators
1. DRUG USAGE				
Age of First Use, ALC	Earlier for Vol. (x)	-----	-----	-----
Age of First Use, MJ	Earlier for Vol. (x)	-----	-----	Later for Freq. (*)
Drug Experience Scale	Greater for Vol. (***)	-----	Greater for Q (***)	Less for Freq. (*)
Frequency of Usage, Last Sem. (Baseline):				
ALC	-----	Greater for NoS (**)	-----	-----
MJ	Greater for Vol. (x)	Greater for NoS (x)	Greater for Q (*)	-----
PD	Greater for Vol. (*)	-----	Greater for Q (**)	Less for Freq. (*)
UP	Greater for Vol. (*)	-----	-----	-----
DN	Greater for Vol. (*)	-----	-----	-----
HD	-----	-----	Greater for Q (**)	-----
"Significant" Usage, Last Sem. (Baseline):				
ALC	-----	Greater for NoS (x)	-----	-----
MJ	-----	-----	Greater for Q (*)	-----
Other	Greater for Vol. (**)	-----	-----	-----
Any of abcve	-----	-----	Greater for Q (*)	-----
2. BIOGRAPHICAL VARIABLES				
School Load	-----	-----	-----	-----
Work Load	-----	-----	-----	-----
Life Experiences	-----	-----	-----	-----
Familiarity with TM	Greater for Vol. (***)	-----	-----	-----

TABLE 4 (Cont'd)

Predictor Variable	Meditation Experiment Comparison			
	TM Vol. vs. Non-Vol.	No Shows (NoS) vs. TM Participants	Quitters (Q) vs. Meditators	Frequent Meditators vs. Infreq. Meditators
Physical Proficiency, Self-Ratings:				
General Athletic Ability	-----	-----	-----	-----
Coordination	-----	-----	-----	-----
Speed	-----	-----	-----	Higher for Freq. (x)
Endurance	-----	-----	Lower for Q (x)	Higher for Freq. (x)
Steadiness and Precision of Movement	-----	-----	-----	-----
Strength	-----	-----	-----	-----
3. GENERAL OUTLOOK/MOOD SCALES				
Life Satisfaction	Lower for Vol. (*)	-----	-----	-----
Anomy	-----	-----	-----	-----
Self-Esteem	Lower for Vol. (x)	-----	-----	-----
State, MAACL, Past several days:				
Anxiety	-----	-----	-----	-----
Depression	-----	-----	-----	Higher for Freq. (x)
Hostility	-----	-----	-----	-----
Trait, MAACL, Past three months:				
Anxiety	-----	-----	-----	-----
Depression	-----	-----	-----	Higher for Freq. (x)
Hostility	-----	-----	-----	-----
State, PAS, Past several days:				
Happiness	Lower for Vol. (x)	-----	-----	Lower for Freq. (*)
Anger	-----	-----	Higher for Q (*)	-----
Fear	-----	-----	-----	-----
Depression	-----	-----	-----	-----
Arousal	Lower for Vol. (**)	-----	-----	-----

TABLE 4 (Cont'd)

Predictor Variable	Meditation Experiment Comparison			
	TM Vol. vs. Non-Vol.	No Shows (NoS) vs. TM Participants	Quitters (Q) vs. Meditators	Frequent Meditators vs. Infreq. Meditators
Trait, PAS, Past three months:				
Happiness	-----	-----	-----	-----
Anger	-----	-----	-----	-----
Fear	-----	-----	-----	-----
Depression	-----	-----	-----	-----
Arousal	-----	-----	-----	Lower for Freq. (*)
4. PERSONALITY TRAITS				
Emotional Stability, TTS	-----	-----	-----	-----
Taylor Manifest Anxiety Scale (TMAS)	Higher for Vol. (**)	-----	-----	Higher for Freq. (x)
Worry	Higher for Vol. (**)	-----	-----	Higher for Freq. (*)
Emotionality	Higher for Vol. (*)	-----	-----	-----
Extraversion, EPS	Lower for Vol. (x)	Higher for NoS (*)	-----	-----
Impulsivity	-----	Higher for NoS (x)	-----	-----
Sociability	Lower for Vol. (*)	Higher for NoS (x)	Lower for Q (*)	-----
Lie Scale, EPS	-----	-----	-----	-----
Socialization, CPI	-----	Lower for NoS (x)	-----	Higher for Freq. (x)
Flexibility, CPI	-----	-----	Higher for Q (x)	-----
Achievement by Independence, CPI	-----	-----	-----	-----
Achievement by Conformance, CPI	Lower for Vol. (*)	-----	-----	-----
Fitzgerald Experience Inquiry (EI)	Higher for Vol. (***)	-----	-----	-----

TABLE 4 (Cont'd)

Predictor Variable	Meditation Experiment Comparison			
	TM Vol. vs. Non-Vol.	No Shows (NoS) vs. TM Participants	Quitters (Q) vs. Meditators	Frequent Meditators vs. Infreq. Meditators
Sensation Seeking Scale (SSS):				
General Scale (GS)	Higher for Vol. (*)	-----	Higher for Q (x)	-----
Thrill and Adventure (TA)	-----	-----	-----	-----
Experience Seeking (ES)	Higher for Vol. (***)	Higher for NoS (x)	Higher for Q (**)	Lower for Freq. (x)
Disinhibition (Dis)	-----	Higher for NoS (*)	-----	-----
Boredom Susceptibility (BS)	Higher for Vol. (**)	-----	Higher for Q (**)	-----

Note.--***, $P < .001$; **, $P < .01$; *, $P < .05$; x, $P < .10$, two tailed.

The nature of the No Show is interesting against the backdrop of concern as to whether the phenomenon is a product of superficial extrinsic factors or of deeply intrinsic self-selections. Most pivotal was the possibility that the heavy drug user, while having volunteered, would opt out of participation in deference to his habit. The profile of the No Show does not bear this out. Although a somewhat heavier MJ user than the TM participant, it is fascinating that the major drug preference of the No Show is for alcohol. Totally consistent with this is his high Disinhibition score within the SSS. Although none of these effects are overpoweringly strong, the implication is that the problem drinker may have an especial reluctance/inflexibility about getting himself all the way into TM. The No Show also exhibited high scores on Extraversion (both Sociability and Impulsivity components).

The meditation Quitter also appears to be the high experience-seeking, boredom-susceptible, sensation-seeking, heavy drug user seen in the TM Volunteer profile. In fact, the potential Quitter, as part of the Volunteer group, may account for a good part of the larger group's deviancy in their highly similar profiles. If so, then many restless, experience-seeking persons doing drugs may view a TM training opportunity, such as presented to them, as another experiential notch to carve on their belt with low likelihood of being able to really follow through with TM (or anything else) on a very sustained basis.

The Frequent Meditator, in contrast to the Quitter, looks like an anxiously unhappy, conventional, low experience seeker, with low lifetime drug experience, late and light MJ use. Thus, he seems to embody many of the unhappy components of the TM Volunteer and is an especially appropriate candidate for the alleged TM benefits. That he continues to meditate, relative to others, in itself suggests the operation of important reward or gain.

The Consequences of Practicing TM

Levels and changes in significant drug use for the Control, Meditator, and Quitter groups are shown in Table 5. Pre-TM, post-TM, and change scores are compared between Meditators and Controls, and between Meditators and Quitters. Consistent with the findings discussed above, the continuing

TABLE 5

Comparison of the Percentages of Ss in the Meditation Experiment Subgroups Significantly Involved[1] with Drugs

Drug Category		Controls N = 21		Meditators N = 21		Quitters N = 6
ALC	Pre	29	*	19		0
	Post	10		14		17
	Change	-19		-05		+17
MJ	Pre	57	*	19	*	67
	Post	52	**	14	**	67
	Change	-05		-05		0
Other (PD, UP, DN, HD)	Pre	29		29	*	33
	Post	24		10	*	50
	Change	-05		-19	x	+17
One or more of above categories	Pre	66	*	33	*	83
	Post	71	***	19	**	83
	Change	+05	x	-14		0

Note.--'t' test comparisons carried out between groups and across time periods; ***, $P < .001$; **, $P < .01$; *, $P < .05$; and x, $P < .10$, all two tailed.

[1]"Significant involvement" with alcohol and with marijuana was defined as usage "3 or 4 times a week" or more; "significant involvement" with other substances was defined as any reported use of two or more substances or more than once a month usage of any one substance.

Meditator, through the process of self-selection, appears less drug-involved to start with. Among the Meditators, 33% were classed as significantly involved with ALC, MJ, or OTHER drugs pre-TM, whereas 66% of the Controls and 83% of the Quitters were so classified.

Despite a much lower initial usage level, however, it is also clear that the reduction of significant drug use among the Meditators is greater than that seen among the Controls. The significance level associated with this difference in change scores was .10 for a two-tailed, or .05 for a one-tailed test. (This is a clear case, in our estimation, where a priori hypothesis justifies the acceptance of a one-tailed evaluation.) There was no reduction at all in significant drug use among Controls and Quitters. In contrast, fewer of the Meditators remained in the category of being significant drug users. A decline of 14% from a value of 33% represents a 42% drop. In terms of individuals, three of seven persons who had been significantly involved with drugs ceased to be after three months' involvement with TM.[1] Among the Quitters, the same five of six significant drug users remained so after having been initiated but quitting meditation.

It is interesting to examine the more specific drug categories. There were no differences to speak of in significant ALC use. The percentage of subjects so involved also seemed relatively low. (Recall that many ALC users were No Shows.) MJ use was notable for the deviantly low use by the Meditators, seen pre-TM as well as post-TM. In fact, levels among the Meditators were only one-third those of the Controls and Quitters. Although some decline was seen for Meditators (from four to three persons), this was a change that was neither significant in itself or discrepant from Quitter and Control groups. The greatest source of the TM drug decline influence shown was in the OTHER category embracing PD, UP, DN, and HD. Here, the number of Meditators involved with these agents decreased from six to two, a statistically significant shift.

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[1]By way of further collation with meditational involvement, it is interesting that 2 of the 4 users in the "Most Frequent Meditation" group changed out of the significant drug usage category, while 1 of the 3 users in the "Stoppers" category did so.

The relation of TM to drug use thus appears from our data to be compound. First of all, some heavy drug users who go into TM, and who subsequently quit practicing meditation, change not one whit in their drug habits. Lest this be viewed as a "failure" of TM to reach these individuals, it should be emphasized that it is equally possible that these individuals have failed to engage properly in TM. We endeavored in a later interview to ascertain how faithfully these TM quitters had abstained from drugs prior to participation and before ceasing the practice of TM. Although it is difficult to judge the candor of their responses, each respondent claimed to have attained a drug-free bodily condition before his TM participation and the majority of them also stated that they had remained off drugs until they stopped meditating. The second finding of major importance was that continuing Meditators decreased their significant drug use, whereas Controls and Quitters did not. Tentative as these findings are, it is fair to say that they are the most methodologically conclusive results yet reported concerning the value of TM as a reducer of drug abuse. Previous studies (Benson & Wallace, 1971; Shafii, Lavely, & Jaffe, 1974) often quoted as linking TM with reduced drug use, lack adequate control baselines. Strictly speaking, they have demonstrated (taking the above studies, respectively) only that some meditators who answer the survey report use less drugs than they had before TM, and that some meditators who answer a survey are more likely to be reformed drug users than are their present non-meditating friends. While not without information value, these studies simply cannot be used to draw inferences about the causal role of TM in reducing drug usage. The present experiment, with a true control group composed of randomly selected, similarly motivated individuals observed over the experimental interval, had the power to establish whether involvement with TM significantly alters drug use. And it appears that this is the case.

Another pivotal area for evaluating TM effects concerned the extent to which it induced Reported Life Changes (e.g., serenity, increased energy, improved health, etc.) of the kinds proclaimed by meditation enthusiasts. Since we were unsure that our conventional test instruments adequately covered

these areas, a self-report instrument was created, as described in the preceding section on research measures. The reliabilities of the nine a priori factors, and their content in terms of constituent concepts, are shown in Table 6, along with the mean scale scores of Control, Frequent Meditator, and Infrequent Meditator group subjects. A number of the factors did discriminate groups with the telling pattern that Frequent Meditators exceeded both comparison groups in the positive direction. Frequent Meditators report greater positive change toward Serene Emotionality, Increased Energy, Performance Effectiveness, Perception of Self, and the Homely Virtues. In the same direction, but less significantly supported, were the factors Mode of Functioning, Perception of Others, and Physical Health.

These positive Life Changes characteristically reported by the Frequent Meditators thus strongly confirm the systematic changes in self-labeling and presumably the experiential behavior of persons involved in the practice of TM. Being more serene, creative, energetic, efficient, and perceptually alert are all major beneficial changes with considerable impact for one's well being and productivity. The zealous enthusiasm of the IMS instructors becomes understandable in this context. Further research along these lines might do well to evaluate performance capability changes directly, along lines suggested by these subjective reports.

Still other criteria for evaluating TM influences were represented by the Outlook/Mood scales and Personality and Adjustment scales. Three conclusions were suggested by the comparisons of pre- to post-TM changes of Frequent Meditators with those of Controls and those of Infrequent Meditators: (1) Life Satisfaction scores increased more for Frequent Meditators than for the Controls (.091 level) and the Infrequent Meditators (.124 level); (2) Mood and Affect changes formed no easily interpretable pattern; and (3) a clear pattern of personality scale shifts was found, such that the Frequent Meditators became higher in Experience Seeking (.013), more Open to Experience (.073), and more Extraverted (.001), rather more so in the Impulsivity (.001) than Sociability (.151) components. Taken together, these latter changes support the image of a somewhat freer, more spontaneous and impulsive person than before. It will be recalled from the predictor

TABLE 6

Comparison of Reported Life Changes in the Meditation Experiment Subgroups

Reported Life Change Factor	Control Subjects N = 21		Frequent Meditators N = 13		Infrequent Meditators N = 13
A. Serene Emotionality (Reduced frustration, anxiety, depression; emotional stability, well-being, serenity, inner peace, evenness of disposition) [8 items, K-R_{20} = .79]	4.10	*	5.46	*	3.69
B. More Flexible Mode of Functioning (Creativity, imagination, intuition, flexibility, spontaneity, openness, sense of humor; integration) [9 items, K-R_{20} = .67]	4.10		4.38		3.62
C. Increased Energy (More able to relax, stamina, energy level, evenness of energy, more restful sleep, reduced fatigue) [6 items, K-R_{20} = .82]	3.19	*	4.38	*	3.23
D. Performance Effectiveness (Efficiency, alertness, quickness, endurance, effectiveness, control of attention, concentration, less distractibility) [8 items, K-R_{20} = .78]	3.86	·	4.77	*	3.31
E. Perception of Self (Breadth of awareness, ability to listen, clearness of surroundings, self-understanding, liking of self, reduced confusion, boredom, restlessness) [8 items, K-R_{20} = .74]	3.71	*	5.15	**	3.00
F. Perception of Others (Tolerance of others; perception of others' needs and roles; liking for others; friendliness, adaptability, understanding of others, sexual adjustment, expressiveness, suggestibility) [9 items, K-R_{20} = .77]	4.86		5.31	·	4.08

TABLE 6 (Cont'd)

Reported Life Change Factor	Control Subjects N = 21		Frequent Meditators N = 13		Infrequent Meditators N = 13
G. Self-Sufficiency (Self-sufficient, self-confidence, powerfulness, efficiency, alertness, quickness, flexibility, adaptability, self-control) [9 items, K-R_{20} = .81]	4.38		5.15	x	3.69
H. Homely Virtues (Ambition, competitiveness, curiosity, diligence, desire for accomplishment, maturity, punctuality, responsibility, self-control, thoroughness) [10 items, K-R_{20} = .61]	4.29	*	5.69	*	3.23
I. Physical Health (Improved overall health, reduced colds/flu, headaches, muscular aches, stomach upsets) [5 items, K-R_{20} = .49]	2.57	·	3.15		3.00

Note.--**, P < .01; *, P < .05; x, P < .10; and ·, P < .20, single tailed.

variable profile of the Frequent Meditator that an especial conventionality, tightness, and low adventurousness was evident. Thus, the pattern of changes seems highly appropriate and beneficial.

The chronic worry and anxiety facet of the pre-TM profile, interestingly enough, did not shift in greater degree with increasing TM involvement. Why this Trait Anxiety and the various affect and mood state instruments did not show simple patterns of benefit among TMers is not clear. To be sure, the serenity factor of the Life Changes inventory showed a marked difference, perhaps because it utilized a comparative change-reporting format.

This account of TM consequences would be incomplete without some mention of those non-controlled impressions which indicated changes in meditators such as those noted by their close associates. A vivid memory to one interviewer was the fervent and unsolicited thanks expressed by the mother of one initiate, who reported that her son had benefitted greatly and was much easier to live with since taking up TM. One of the more frequent meditators was a shining success story. That we had difficulty contacting him at home became understandable when we learned that he was carrying a full course load and working on two jobs. He subsequently reported having greatly increased energy, having quit all drugs, and having encouraged his wife and friends to take up TM. We found no balancing pattern of negative reactions to meditation. A few reported having unpleasant experiences while meditating, but for the most part non-positive reactions were to the effect that meditation just didn't seem to have much impact.

A considerable regularity and self-discipline is required to practice <u>any</u> act twice daily at regular times, and many interviewees, particularly those in the occasional meditator category, insisted that their lives were just too variable and uncontrollable to permit such practice. Some respondents felt that the TM instructors were so inflexible and insistent upon twice daily practice that they felt discouraged about meditating. Virtually all initiates felt that they had gained something of value

in their knowledge of TM, and were grateful for their free training. But clearly it was not a particularly opportune time for most of the students to have embarked upon the study of TM. It seems that they did respond to the opportunity for free training mainly because we presented it to them at this particular time. Presumably the motivations of our student meditators were not so compelling as those of the average TM initiate who finds his way to the nearest IMS Center with sufficient money to pay the fee. A median frequency of meditation of 3 to 4 times weekly among the students is estimable in this context. We have no comparable frequency data for TM initiates arriving at IMS Centers in the usual manner.

In summary, cogent profiles of the TM Volunteers, No Shows, Quitters, and Frequent Meditators were obtained. The Volunteer groups contained unhappy, anxious introverts and variety and experience-seeking adventurers, a number of whom were deeply involved with drugs. The No Show was a Disinhibition type of Sensation Seeker who favored alcohol. The meditation Quitter was into non-alcoholic drugs and was the easily bored experience-seeker seen in the Volunteer. Finally, the Frequent Meditator was the worry-wart facet of the Volunteer profile--conventional, depressed, unhappy, nonadventurous, and low in drug involvement.

Important and clear consequences of involvement with TM were found. Significant drug involvement, in general, declined among Frequent Meditators but not at all among Controls and Infrequent Meditators. Decreased usage of PD, UP, DN, and HD appeared primarily responsible. The clear tendency for TM Quitters to rank very high in drug use was ambiguous in interpretation. The drug user might have failed TM, just as TM might have failed the drug user. A series of important Reported Life Changes characterized the Frequent Meditator. Again compared to the Infrequent Meditator and Control groups, more Serene Emotionality, Increased Energy, Performance Effectiveness, Perceptions of Self, and progress in Homely Virtues were reported. The experiential benefits thus claimed by meditators received controlled experimental support and suggested the benefits that might also be detectable in creative and sustained energy performance tasks. The drift of differential changes in Outlook, Mood, and Personality variables was the apparent shift of

Frequent Meditators toward a more adventurous, impulsive, and expressive life pattern.

V. SUMMARY

A longitudinal, controlled experiment was carried out in a natural setting to determine the effects of Karate and Meditation upon psychosocial indicators of adjustment, including levels of significant drug use. The rationale of the study was the concept of "constructive alternatives to drug abuse," modified to address underlying causes of drug abuse, rather than simply to substitute activities. Since tension, lack of self-understanding and low self-esteem are prominently cited as motives for excessive drug involvement and other self-destructive behavior, remedial measures were sought in the form of practical, personal resource training. Two techniques were chosen for parallel evaluation. Karate training, involving gradual mastery of precise body movement, was selected as a means to enhance self-esteem and self-confidence. Transcendental Meditation (TM), an easily learned procedure to induce profound relaxation, was chosen as a means to reduce anxiety and promote self-understanding.

Two hundred and seventy-five male college students were employed as participants in a longitudinal "Life Styles in the Seventies" survey, designed to appraise in depth personal habits such as drug use, mood and general outlook, and adjustment traits. The purpose of this initial start-of-the-semester survey was to provide baseline information, and the final end-of-the-semester survey the criterion measures of psychosocial adjustment for evaluating the intervening 4-month participation by some subjects in TM and Karate. Immediately after securing baseline survey information, the subjects were asked to volunteer for a leisure activity study which would provide free training in Karate and/or TM, to some of those who desired it. Volunteers were randomly assigned either to untreated control or training groups. Follow-up contact assessed the diligence of Karate students and the degree to which TM initiates practiced meditation in the intervening period, in order that Karate students and meditators could be compared with the dropouts and control group subjects for their respective condition. The collection of pre-treatment measures enabled profile studies of the Volunteer, the No Show, the Quitter, and the Frequent Meditator in

the TM experiment, and the Volunteer, No Show, Dropout, and Top student in the Karate experiment.

The predictive profiles of Karate involvement were largely suggestive. A variety of beneficial life changes were attributable to Karate--e.g., improved self-esteem and improvements of mood--but these effects had not translated into reduced drug use within the time frame of the experiment.

The findings of the TM experiment were strong, perhaps because meditation is believed to have immediate as well as cumulative benefits. The TM Volunteers proved to be heavily into drugs and to exhibit unhappy, chronically anxious, introverted adjustment tendencies as well as experience seeking, boredom susceptibility, and openness to experience. To some extent, the sensation seeking heavy drug users tended to wind up in the No Show and Quitter subgroups. On the average, those destined to become Frequent Meditators were anxious, unhappy, and not very adventurous types. The consequences of practicing TM, gauged against untreated controls, were also clearcut. Meditators were reliably lower in initial levels of significant drug use. Meditators also reduced significant drug use from baseline values, while neither Controls nor Quitters showed any such change. Important TM benefits were found on self-reported Life Change factors--Serene Emotionality, Increased Energy, Performance Effectiveness and Perception of Self--confirming the incidental reports of meditators as well as implying practical performance changes. Adjustment changes due to TM included greater Life Satisfaction and a shift toward a more spontaneous, impulsive and expressive style.

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APPENDIX A

THE BASIC DRUG USAGE QUESTIONS

In the following [illegible] drugs [illegible] with the more commonly [illegible] each drug [illegible] the categories listed below. The [illegible] given after each category will be used throughout this section of the survey:

ALCOHOL (AL) - beer, wine, liquor, mixed drinks

MARIJUANA (MJ) - pot, grass, weed, tea, Mary Jane, reefers, joints, hashish, hash

PSYCHEDELICS (PD) - LSD, acid, orange sunshine, purple haze, window pane, Mr. Natural, DMT, DET, mescaline, peyote, psilocybin, sassafras, STP, DOM, serenity, tranquility, and peace

UPPERS (UP) - Benzedrine (bennies), cocaine (coke, dust, snow), Dexedrine, Methedrine, Eventin, Mirapont, Preludin, black beauty, white crossroads, speed, pep pills, hearts, eyeopeners

DOWNERS (DN) - Barbiturates, Nembutal, Seconal, Librum, Miltown, Equanil, tranquilizers, Thorazine, Phenobarbital, blue angels, goof balls, red devils, Carbitol, sleeping pills, Quaalude, yellows

HARD DRUGS (HD) - Heroin, smack, skag, horse, joy powder, Codeine, Demerol, Methadone, dollies, Morphine, Opium

1. How old were you when you first tried each of the following types of drugs and actually experienced an effect (got high, stoned, wrecked, spaced out, etc.)?

Drug	Age	Name of actual drug
ALcohol	___	
MariJuana	___	
PsycheDelics	___	
UPpers	___	
DowNers	___	
Hard Drugs	___	

2. Thinking of all the times during last semester you have used the various drugs mentioned below, mark an "X" in the box which indicates your frequency of usage for each drug group.

	AL	MJ	PD	UP	DN	HD
Usually twice a day or more						
Usually once a day, sometimes twice						
Only once a day						
Nearly every day						
3 or 4 times a week						
Once or twice a week						
2 or 3 times a month						
About once a month or less						
Never during last semester						

DRUG USAGE DATA

1. Self-reported drug experimentation, EVER (to the point of feeling an effect).

   a. Incidence of EVER usage, % of 275 respondents:

ALC	95%
MJ	84%
PD	48%
UP	41%
DN	38%
HD	24%

   b. Intercorrelations of EVER usage:

	ALC	MJ	PD	UP	DN
MJ	84				
PD	79	100			
UP	71	100	93		
DN	71	100	88	90	
HD	56	100	97	92	75

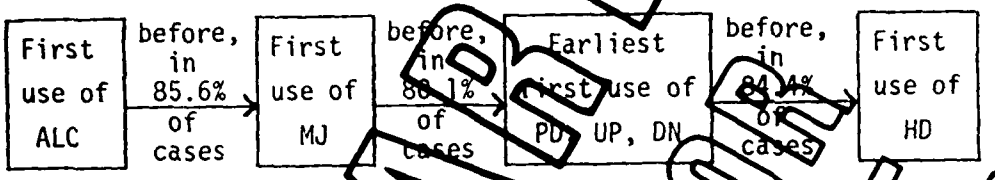
Note.--Tetrachoric coefficients, decimals omitted.

   c. The Drug Experience Scale, a cumulative (Guttman) pattern of EVER drug use responses:

Scale Score	Usage Response Pattern	Percent of Cases
0	None	4%
1	ALC	12%
2	ALC + MJ	31%
3	ALC + MJ + One/More [PD,UP,DN]	29%
4	ALC + MJ + One/More [PD,UP,DN] + HD	24%

Note.--(1) Coefficient of Reproducibility = .997 (3/124 possible scaling errors).
(2) Four-month interval, test-retest reliability of scale scores = .97.

d. Temporal patterns of EVER drug use, based upon reported age at time of first use of a drug in the designated category, using the conservative procedure of distributing ties (i.e., same age, in years, for two drug categories) on a 50-50 basis between categories:



2. Drug usage, last semester:

a. Reported frequency of usage, last (1st) semester:

Scale Units	Frequency Category	Drug Category: ALC	MJ	PD	UP	DN	HD
8	Twice a day or more	2	6	0	0	0	0
7	Once a day, sometimes twice	6	16	0	1	0	0
6	Once a day	9	19	0	1	0	0
5	Nearly every day	14	25	0	1	0	0
4	3 or 4 times a week	27	40	0	1	1	0
3	Once or twice a week	61	51	1	3	2	0
2	2 or 3 times a month	81	61	4	5	4	1
1	Once a month or less	90	75	17	18	14	5
0	Never, last semester	100	100	100	100	100	100

Note.--Entries are cumulative percentages of persons reporting the given (or more frequent) rate of usage of drugs in the indicated category. For example, 51% of the subjects claimed to use MJ at the rate of once a week or more.

b. Intercorrelations among categories of drug use, last semester:

	ALC	MJ	PD	UP	DN
MJ	32				
PD	45	76			
UP	40	50	75		
DN	60	62	70	61	
HD	45	40	75	54	62

Note.--Entries are tetrachoric correlation coefficients, decimals omitted. Drug usage variables were dichotomized at 'nearly every day' or more frequently (vs. less than 'nearly every day') for ALC and for MJ, and at any usage (vs. none) for PD, UP, DN, and HD.

c. Stability of drug usage from 1st to 2nd semester:

	Mean levels, in frequency scale units*		Test-Retest correlations between usage frequency, 1st and 2nd semesters
	First Semester	Second Semester	
ALC	2.9	2.9	.62
MJ	2.9	2.8	.81
PD	0.3	0.3	.37
UP	0.3	0.3	.59
DN	0.2	0.2	.45
HD	0.1	0.1	.50

*For scale units, in relation to actual frequency, see table in 2a above.

APPENDIX B

THE LIFE CHANGES INVENTORY

Please indicate how much you believe you have changed during the last three months in the categories of behavior listed below. Place an "X" in the column indicating the appropriate degree and direction (increase or decrease) of change experienced.

	In the last 3 months:							
	Little or no change (0-25%)		Some change (26-50%)		Considerable change (51-90%)		Complete change (91-100%)	
Category	Incr.	Decr.	Incr.	Decr.	Incr.	Decr.	Incr.	Decr.
1. Ability to listen	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
2. Ability to relax	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
3. Adaptability	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
4. Alertness	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
5. Ambition	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
6. Anxiety	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
7. Boredom	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
8. Breadth of awareness	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
9. Clearness of surroundings	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
10. Cold/flu	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
11. Competitiveness	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
12. Concentration	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
13. Confusion	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
14. Contemplation	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
15. Control of attention	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
16. Creativity	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
17. Curiosity	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
18. Depression	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
19. Desire for accomplishment	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
20. Diligence	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
21. Distractibility	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
22. Effectiveness	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
23. Efficiency	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
24. Emotional stability	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]

Category	In the last 3 months: Little or no change (0-25%) Incr.	Decr.	Some change (26-50%) Incr.	Decr.	Considerable change (51-90%) Incr.	Decr.	Complete change (91-100%) Incr.	Decr.
25. Energy flow (evenness, consistency)	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
26. Energy level	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
27. Endurance	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
28. Evenness of disposition	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
29. Expressiveness	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
30. Fatigue	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
31. Flexibility	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
32. Friendliness	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
33. Frustration	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
34. Headaches	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
35. Imagination	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
36. Inner peace	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
37. Intuition	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
38. Liking for others	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
39. Liking of self	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
40. Logical ability	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
41. Maturity	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
42. Muscular aches/pains	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
43. Openness	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
44. Overall health	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
45. Pace of life	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
46. Perception of others' needs and roles	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
47. Performance in school	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
48. Powerfulness	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
49. Punctuality	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
50. Quickness	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
51. Rationality	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]

Category	In the last 3 months: Little or no change (0-25%)		Some change (26-50%)		Considerable change (51-90%)		Complete change (91-100%)	
	Incr.	Decr.	Incr.	Decr.	Incr.	Decr.	Incr.	Decr.
52. Responsibility	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
53. Restfulness of sleep	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
54. Restlessness	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
55. Self-confidence	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
56. Self-control	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
57. Self-sufficiency	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
58. Self-understanding	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
59. Sense of humor	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
60. Sense of integration	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
61. Sense of well-being	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
62. Serenity	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
63. Sexual adjustment	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
64. Spontaneity	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
65. Stamina	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
66. Stomach upsets	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
67. Suggestibility	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
68. Tendency to analyze	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
69. Thoroughness	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
70. Tolerance of others	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
71. Understanding of others	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]